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University of South Carolina  
University Technology Services

# PROPOSAL FOR IMPROVING THE UTS LAW CENTER BILLING PROCESS

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STATE DOCUMENTS

## INTRODUCTION

The University of South Carolina (USC), University Technology Services (UTS) has several billing systems which are used to bill customers for products purchased and services provided. However, this report will focus primarily on the billing system affectionately known as “Mr. Bill” which was exclusively developed for use by the UTS Law office formerly known as University Instructional Services (UIS). The UTS Law Office is located in the sublevel area of the USC School of Law.

The UTS Law billing system was established back in the early 1990s by a former UTS employee. It was developed using Microsoft Access which is a relational database management system from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and software development tools. Mr. Bill was designed to keep track of the resources used to provide products and services to customers of UIS. Those customers include USC departments, faculty, staff, and students (all considered internal customers) as well as state agencies or businesses outside of the USC community (external customers).

## PROBLEM STATEMENT

### **Program Issues**

Mr. Bill, just like any other billing systems UTS uses, involves a process. The goal in this section of the report is to look at the current problems or failures UTS is experiencing in order to address how the process can be made better—keeping in mind the fact that with technology, there will always be room for growth.

First and foremost, Mr. Bill is not broken. It continues to work and it continues to do what it was designed to do. However, it was designed based on business practices over 20

years ago and not much functionality in Mr. Bill has occurred because of limitations stemming from developing the program using Microsoft Access 2003.

Mr. Bill relies heavily on version 2003 and unfortunately any version beyond 2003 causes Mr. Bill to dysfunction. In addition, since certain modules of Access were introduced in later versions, Mr. Bill will never be able to include pertinent components such as a web-based component for online functionalities, an inventory control component which would allow a more accurate assessment of our inventory, and a project management component which would allow accurate partial billing for extended projects.

In Microsoft Access, a programmer has the ability to create tables, queries, forms and reports using the Visual Basic Script (VBScript) language. Whenever a programmer writes an application using VBScript, he creates what looks like or what simulates a program. VBScript is an active scripting language also developed by Microsoft. It is designed as a "lightweight" language with a fast interpreter for use in a wide variety of Microsoft environments. This is how the "Mr. Bill" billing system came into existence. In other words, because Mr. Bill was developed out of Microsoft Access, it is made up of modules, forms, reports, table and queries. It is more of an interactive dbase system that could be used to do things ad hoc and on the fly. However, it is not designed as a true programming language system. It uses pieces of programming languages to simulate a programming system.

Technology will continue to grow and hackers will continue to exist. Therefore, for security reasons Microsoft has implemented changes to its security models, code signing and its infrastructure. Unfortunately, to reiterate, due to the growth of UTS's business



practices, Mr. Bill has been unable to “keep up” and does not function properly when any version beyond Access 2003 is attempted.

### **Process Issues**

There are a number of process issues dealing with Mr. Bill. One of the issues is the paper flow process which includes the steps used to keep track of the original *Request for Services* (RFS) forms like the form referenced in **Appendix A**. The problem is unless someone is available to train how to carry out this process, there is no way a new trainee (even with the aid of a written reference guide) will be able to figure out the paper flow on his own.

Mr. Bill’s paper flow process includes a vast amount of paper and it lacks the reference guide necessary to explain how to organize the papers that are received from the billing producers. To elaborate, as with many “home grown” systems, Mr. Bill does not include a formal written reference manual to help acclimate new users on how the paper flow process should be implemented. Nevertheless, there is a reference guide generated by a former employee, but it basically assists with steps on how to run the billing cycle. In other words, it does not give specific “how to” instructions on understanding the paper flow process. So, needless to say, one of the first problems encountered with Mr. Bill was trying to understand the paper flow process with reference to the RFS forms. Not only are a vast amount of white and colored RFS forms received from the billing producers, more importantly, the billing coordinator had no idea what to do with the different RFS forms.

Once the RFS form is completed by the customer, the billing producer makes copies on yellow, green and blue paper. The billing producer then provides the appropriate

colored copy to the billing coordinator at certain stages. Descriptions for each color are as follows:

White	Original <i>Request for Services</i> form completed and signed by the customer.
Yellow	Copy of <i>Request for Services</i> form returned to the customer which includes the project number for their records.
Green	Copy of <i>Request for Services</i> form kept by the billing producers for their records.
Blue	Copy of <i>Request for Services</i> form provided to the billing coordinator which signifies the project is complete and ready to bill.

At one point, and for good reasons at that time, the billing coordinator received three of the four copies of the RFS form—white, yellow and blue. However, within the past year and half, this step has been modified in an effort to reduce paper. Presently, the most copies the billing coordinator may receive are two—white and blue. Fortunately, it became evident that producing so many copies of the same RFS form was unnecessary.

The next issue with Mr. Bill includes the invoicing process for external customers. An official USC invoice like the invoice referenced in **Appendix B** must accompany the UTS billing statements like the statement referenced in **Appendix C**. The USC invoice is a four part, carbonless form and needless to say, Mr. Bill is not designed to automatically process the data which is necessary to include on the invoice. What makes this an issue is the fact that generating the USC invoice is a tedious, manual process for the billing coordinator since Mr. Bill is not capable of generating the invoice.

At one point when generating the official USC invoice the billing coordinator had to manually type the information data on the form using a typewriter—reminding you the USC invoice is a carbonless, four part form which meant the billing coordinator had to type

the form four different times. But, fortunately a template was developed in Microsoft Excel which assists with automating this process.

The main issue with the billing statements is the fact that customers (more so speaking of internal customers) cannot access it electronically themselves. As a result, the billing statements must be mailed. Electronic access to the billing statements as opposed to mailing them would allow the customers to retrieve their billing statements the next day after the billing cycle is processed. Mailing the billing statements can take up to five business days when you consider the time it takes for the billing coordinator to print, fold and stuff envelopes. Not to mention, the use of envelopes to mail the statements contributes to the tediousness of the process including the vast amount of paper used. Then there is the time it takes for the billing statements to reach its destination once it is placed in intra-campus mail—usually up to two days. This is an issue because yet again, it is a manual process for the billing coordinator which causes a slowdown in production. More importantly, the accessibility of Mr. Bill statements should be consistent with the accessibility of other billing statements UTS provides. Customers should be able to retrieve all UTS statements electronically. When necessary, the only statements UTS should be mailing are the statements which accompany the USC invoices for external customers.

#### DATA COLLECTION

Data were collected from respondents in two ways—via one-on-one interviews or via the World Wide Web. The interviews were conducted with managers, programmers and billing producers. In addition to providing the historical background information as to why and how Mr. Bill was established, their involvement with Mr. Bill include, but may not be limited to the following: 1) overseeing the individuals who work with Mr. Bill; 2)



creating projects and/or entering data into Mr. Bill; 3) resolving Mr. Bill issues; 4) installing Microsoft Access 2003 on individual computers and changing the settings so the application runs properly; 5) working with the tables, queries and forms within Access 2003; 6) creating reports when requested or as needed; 7) making or requesting programming changes when necessary; 8) creating projects; 9) entering billable items; 10) reviewing the projects for accuracy; 11) marking the projects “ready to bill” when applicable and 12) working intimately with the billing coordinator.

The questions asked during the one-on-one interviews can be found in **Appendix D**. The advantages of the one-on-one interview were to allow the opportunity to explain the purpose for the research and to allow personal responses. The one-on-one interviews also allowed personal contact between the researcher and interviewee. The disadvantage of the one-on-one interviews was the fact that it was time consuming.

A survey questionnaire, powered by SurveyMonkey (Copyright © 1999-2011) was used via the World Wide Web. The questions asked in the survey are referenced in **Appendix E**. SurveyMonkey is an online/web-based service for collecting survey data anonymously. In addition to anonymity, other advantages of using SurveyMonkey included, privacy, less cost to prepare and gather data, access to a wide base of respondents, time for respondents to formulate answers, and a timely turnaround. Disadvantages for collecting data online included the potential for a low response rate, a lack of opportunity to explain the study to individual respondents and the lack of personal contact between the researcher and respondents.

After the questions were selected, each participant received an e-mail with a hyperlink which directed them to the website to complete the questionnaire.

SurveyMonkey assigned a unique Uniform Resource Locator (URL) or link for participants to access the questionnaire.

Approximately two weeks were selected within which participants were asked to complete the survey. A total of 18 participants were asked to complete the survey. Out of a total of 13 who started the survey, 11 (84.6%) actually completed the survey.

The introduction page of the survey thanked each respondent for participating, explained the purpose of the survey and explained the benefits of the respondent's role in participating in the survey. Participation in this survey was voluntary and individual respondent answers remained anonymous and confidential.

#### DATA ANALYSIS

The importance of the interviews and the survey was to get others perspectives on their experience with Mr. Bill. The billing coordinator's perspective is just one area at which to look. Others users were able to provide perspectives on their specific use of the billing program.

The participant's responses from the survey revealed that while a little over half (54%) are satisfied with using Mr. Bill, the same percentage either only used Mr. Bill or never used any other billing program. The survey also revealed that most users (75.1%) rated Mr. Bill as less effective with other programs used. One of the main responses shared was that Mr. Bill lacks confidence with its reporting tool. Almost all reports are never accurate which causes the validity of the data to be questionable. Mr. Bill's inability to allow individuals to generate his own query was another issue shared.

Overall the responses were interesting, however, not surprising. Because of the age of Mr. Bill and not to mention the potential threats we may face if we continue to use it, it is



evident it is time to move toward a true billing system which can accommodate present and future needs.

#### IMPLEMENTATION PLANS AND EVALUATION METHODS

UTS have already invested time and money in one other billing program. This billing program is known as Pinnacle. Given the issues we are currently experiencing with Mr. Bill, there has been some migration of billing data from Mr. Bill into Pinnacle. UTS also plan to hire a Technology/Business Analyst to specifically look at all of the billing systems (including the Contract Management System) with the hopes of determining one billing system which can be used for all types of billing charges. As the UTS billing coordinator, I will be able to work with the analysts and provide input that would support his findings of a new billing system.

Once UTS is ready to move forward with the replacement of a new billing system, the plan is to make sure the new system will be able to interface with OneCarolina (which is in the process of being developed). OneCarolina will be an integrated digital system linking the University's eight campuses while allowing students, faculty, and staff access to reliable, integrated information. It also will replace outdated administrative computing applications, including Student Information Systems, Finance, Sponsored Programs and Human Resources into one easily-accessible, Web-based system. Interfacing with OneCarolina is highly desirable since billing for services would be able to flow directly into the University's accounts receivable system. The new system is part of the SG+HE Banner suite of products and will be utilizing TouchNet as the cashiering component. Most modern day systems will have the capability to interface with the systems we are putting in for OneCarolina, but Mr.Bill is not one of them. The system was designed and runs on an

unsupported version of Microsoft Access and poses both technical and security risks. The time and effort required making it compatible and secure is extensive with no guarantee that the user interface would be compatible with future client workstations.

The new billing system must also be able to interface with the USC Accounting Services Intranet Systems. The USC Accounting Services Intranet System is one of many accounting tools available which helps employees perform various financial duties. The tools include the *Accounting Entry Tool* which is used for the creation, management and submission of various accounting entries and the *Accounting Report Tool* which is used for advanced reporting against the general ledger system. Interfacing with the Accounting Services Intranet Systems is a priority because it is the tool used to upload billing transactions to the University's general ledger for internal billing transfers. While interfacing with the Accounting Services intranet in its current state may be possible with flat file exchanges, the previous mentioned issues still come into play. Additionally, the Accounting Services intranet will also be replaced with OneCarolina.

Mr. Bill was designed and created by a talented user trying to solve a business need. While this worked for the existing office, the process did not involve a standard software development lifecycle (SDLC) and therefore flawed from the start. Of course, redesigning Mr. Bill is also an option—however a time consuming and costly option, I might add. If a redesign is chosen, a standard methodology with a full SDLC should be used. The methodology must include all processes from scope to deployment, with a successful turnover to operations. An essential process missed in the original was the documentation of business requirements that translate to functional requirements and eventually technical specifications. The methodology would include sitting down with functional

areas (e.g. programmers, managers, billing users), defining functional requirements and defining technical requirements. If the following is done, the programmer will do a better job at coding properly and insuring that everything fits together when redesigning the billing program. In summary, the use of a standard methodology would allow all areas to be covered (e.g. input, output, transactions, reporting etc.). While redesign is always an option, the alternative of buying an off the shelf software should also be assessed.

### SUMMARY AND RECOMMENDATIONS

In conclusion, the responses from the interviews and the feedback from the survey ultimately resulted in the majority agreeing that it is time for Mr. Bill to retire. Mr. Bill started out as a system that solved a purpose of what it was initially designed to solve. However, because UTS's business practices have grown, UTS have outgrown Mr. Bill. As a result, it would be wise to continue along the path of replacing Mr. Bill in the near future.

UTS face potential threats with the continued use of Mr. Bill. These threats includes, but are not limited to, 1) incompatibility with operating systems which eventually will run in modes that the manufacture will no longer support, 2) eventual nonsupport of Access 2003 by Microsoft and 3) potential shut down (crash) of Mr. Bill, due to vulnerability. To say the least, Access programming is not an enterprise programming language specialized by UTS. This results in a limited number of programmers who are familiar with the Access program. Therefore, it is my strong recommendation that UTS continue down the path of replacing Mr. Bill sooner than later.



## APPENDIX A—UTS Request for Services Form

Received by UTS: Date _____	Producer _____	Dept. _____	Project Use _____	UTS Project Number _____
Project Title _____		Due Date _____		

# UTS

## Request for Services

**University Technology Services**  
 University of South Carolina / Law Center, Sub-Level 1  
 Columbia, S.C. 29208 / (803) 777-9100 / FAX (803) 777-6396

Requestor \_\_\_\_\_ Dept./Agency \_\_\_\_\_  
 Position \_\_\_\_\_ Phone \_\_\_\_\_ Address \_\_\_\_\_  
 Date Needed \_\_\_\_\_ Contact \_\_\_\_\_  
 Services Needed: \_\_\_\_\_

### Authorization

Typed Name & Title \_\_\_\_\_  
 Billing Contact \_\_\_\_\_ Signature \_\_\_\_\_  
 Not to Exceed \$ \_\_\_\_\_ Date \_\_\_\_\_

Dept. No.	Fund No.	Object Code
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Services / Products Delivered	Quantity	Services / Products Delivered	Quantity

Date Completed _____	Producer OK _____
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10-25-05

# APPENDIX B—USC Invoice



54708  
**INVOICE**

0000 Z005 12780

LIS-00-0353

December 20, 2011

**UNIVERSITY OF SOUTH CAROLINA**  
COLUMBIA, SC 29208

USC Law School (c/of USC Foundation #1A3822)  
ATTN: ~~XXXXXXXX~~  
Law School, Room 202  
USC COLUMBIA CAMPUS



UNIVERSITY OF SOUTH CAROLINA  
FINANCIAL SERVICES  
ACCOUNTS RECEIVABLE  
COLUMBIA, SOUTH CAROLINA 29208

TERMS: NET 20 DAYS

TO ASSURE PROPER CREDIT, PLEASE RETURN SECOND COPY WITH REMITTANCE

UNIVERSITY TECHNOLOGY SERVICES REFERENCE ACCOUNT - 2012-05-1067

SEE ATTACHED FOR ACCOUNTING AND BILLING DETAILS

				TOTAL	\$78.00
CREDIT TO ACCOUNT				UNIVERSITY TECHNOLOGY SERVICES (LAW CENTER)	
DEPT.	FUND	CLASS	AMOUNT	DEPARTMENT	
				SIGNATURE	
				777-9100	
				TELEPHONE ( )	

COPY 4 - DEPARTMENT COPY

## APPENDIX C—UTS Billing Statement

**BILLING STATEMENT**  
**University Technology Services**

**Final Billing**  
 12/20/2011

**DEIS#:** 29550

**RQ#:**

**Project Nbr:** 2012-05-1067

**Client:** ~~CAROL M. KOTHELM~~

**Ph#:** 7-3408

**Date Requested:** 10/25/2011

**Department:** LAW SCHOOL

**Address:** LAW CENTER

**Description:** CLE Reunion sound: 11/5/11

Quantity	Materials and Services Provided	Unit	Cost	Total
1	Microphone, wireless	1/2 da	48.00	48.00
1	Soundman	hr	30.00	30.00
<b>Materials/Services Provided Total:</b>				<b>78.00</b>
<b>Tape and Services Total</b>				<b>78.00</b>

<b>Service Department</b>	<b>Dept</b>	<b>Fund</b>	<b>Object</b>	<b>Bill Amount Now</b>
University Technology Services	10120	A000	48850	78.00

<b>Requesting Department</b>	<b>Dept</b>	<b>Fund</b>	<b>Object</b>	
LAW SCHOOL	15800	INVO	INVO	78.00

**Client Copy**  
 Retain for your records



## APPENDIX D—One-On-One Interview Questionnaire

### CPM Project—One-On-One Interview Questionnaire

1. What is “Mr. Bill”?
2. Why is it becoming obsolete?
3. Why are we still using Mr. Bill?
4. What are the plans for discontinuing the use of Mr. Bill?
5. What are strengths of Mr. Bill?
6. What are weaknesses of Mr. Bill?
7. What potential threats may we incur by continuing to use Mr. Bill?
8. Current Billing Process vs. Proposed Billing Process
9. What is a problem with Mr. Bill you see and why is this problem?
10. Based on the services we provide, do you think a customer will be able to initiate his/her own request via an automated system?

## APPENDIX E (cont.)—Survey Monkey Questionnaire, page 1

Q1 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*1. How often do you use Mr. Bill?**

- ☐ Extremely often
- ☐ Very often
- ☐ Moderately often
- ☐ Slightly often
- ☐ Not at all often

Q2 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*2. Why do you use Mr. Bill? (Please check all that apply)**

- ☐ To create projects
- ☐ To review projects
- ☐ To enter billing items/expenditures
- ☐ To run billing
- ☐ To run reports
- ☐ To provide estimates
- ☐ To enter tapes
- ☐ To update vendors
- ☐ Other (please specify)

Q3 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*3. Overall, are you satisfied/disatisfied with your experience using Mr. Bill?**

- ☐ Extremely satisfied
- ☐ Moderately satisfied
- ☐ Slightly satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Slightly dissatisfied
- ☐ Moderately dissatisfied
- ☐ Extremely dissatisfied

## APPENDIX E (cont.)—Survey Monkey Questionnaire, page 2

Q4 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*4. How easy is it to find the information you are looking for in Mr. Bill?**

- ☐ Extremely easy
- ☐ Very easy
- ☐ Moderately easy
- ☐ Slightly easy
- ☐ Not at all easy

Q5 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*5. How much do you like using Mr. Bill?**

- ☐ Like a great deal
- ☐ Like a moderate amount
- ☐ Like a little
- ☐ Neither like nor dislike
- ☐ Dislike a little
- ☐ Dislike a moderate amount
- ☐ Dislike a great deal

Q6 [Edit Question](#) ▼ [Add Question Logic](#) [Move](#) [Copy](#) [Delete](#)

**\*6. How effective would you rate Mr. Bill with other billing programs you may use? Please explain your answer in the comment box below.**

- ☐ Much more effective
- ☐ Somewhat more effective
- ☐ Slightly more effective
- ☐ About as effective
- ☐ Slightly less effective
- ☐ Somewhat less effective
- ☐ Much less effective
- ☐ Mr. Bill is the only billing program I currently or have ever used.

Explanation requested (please specify)



APPENDIX E (cont.)—Survey Monkey Questionnaire, page 3

Q7 [Edit Question](#) ▼ [Move](#) [Copy](#) [Delete](#)

**\*7. What problems have you encountered using Mr. Bill?**

Q8 [Edit Question](#) ▼ [Move](#) [Copy](#) [Delete](#)

**\*8. THIS QUESTION PERTAINS TO PROGRAMMING CHANGES. Whether you are a programmer or a back end user, please be specific and describe your experience(s) with either making programming changes (i.e. programmers) or requesting programming changes (i.e. back end users). In either case, were you satisfied with your results?**

Q9 [Edit Question](#) ▼ [Move](#) [Copy](#) [Delete](#)

**\*9. Base on your experience, what recommended changes would most improve the use of Mr. Bill?**

Q10 [Edit Question](#) ▼ [Move](#) [Copy](#) [Delete](#)

**\*10. In your own words, please use the space below to elaborate on any of the previous questions or share at least one other comment about your overall experience(s) using Mr. Bill?**